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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/759,398	01/16/2004	Kenji Hattori	5332-9PCON	7478

7590 08/23/2006

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EXAMINER	
HON, SOW FUN	

ART UNIT	PAPER NUMBER
1772	

DATE MAILED: 08/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/759,398	HATTORI ET AL.	
	Examiner	Art Unit	
	Sow-Fun Hon	1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 5-7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 5-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/17/06 has been entered.

Withdrawn Rejections

2. The 35 U.S.C. 103(a) rejections of claims 1-3, 5-7 over Tanaka in view of Yamazaki as the primary combination, are withdrawn due to Applicant's amendment dated 7/17/06.

New Rejections

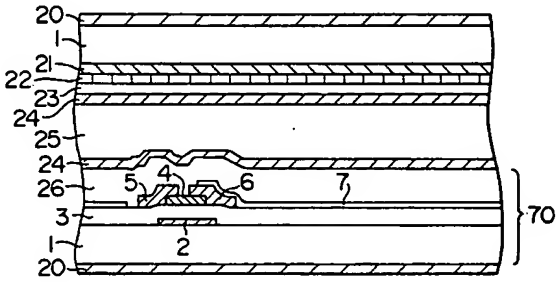
Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1, 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuzaki (US 5,157,470) in view of Tanaka (US 6,686,985), as evidenced by Yamazaki (US 6,326,642).

Regarding claim 1, Matsuzaki teaches a substrate assembly in Fig. 8B, shown below, comprising: a glass substrate (1, column 3, lines 5-6, Fig. 8B); a foundation film (insulating film 3, Fig. 8B), directly formed on said glass substrate; a pixel electrode film (7, column 3, lines 10-13, Fig. 8B), directly formed on said foundation film; and a liquid crystal layer (25, column 10, lines 19-20, Fig. 8B) formed on said film.

FIG. 8B



Matsuzaki teaches that the pixel electrode film is transmitting (transparent, column 10, lines 15-16), but fails to teach that it is semi-transmitting and reflective, let alone that it is made of aluminum (Al).

However, Tanaka teaches that the pixel electrode film can be semi-transmitting and reflective (transflective type, reflection layer is thinly formed to be semi-transparent, column 7, lines 17-19), made of aluminum (column 7, lines 8-11) instead of transmitting (transmissive, column 7, lines 5-10), for the purpose of providing the desired transflective optical properties (column 7, lines 17-19), and hence a semi-transmitting mirror-possessing substrate assembly.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used a semi-transmitting and reflective film made of aluminum, in place of the transmitting film in the substrate assembly of Matsuzaki, in

order to provide the desired transflective optical properties, and hence a semi-transmitting mirror-possessing substrate assembly, as taught by Tanaka.

Matsuzaki in view of Tanaka fails to disclose the thickness of the foundation film.

However, Tanaka teaches that the foundation film (insulator film 201, column 7, lines 20-30), formed directly on the glass substrate (column 7, lines 20-30), is present to prevent impurities from diffusing into the other films; and that if no diffusion of impurities occur, then the foundation film can be omitted (insulator film 201, column 7, lines 25-30). Thus the claimed thickness range of greater than 0 to 8 nm for the foundation film is the result of the optimization of the process of forming the substrate assembly, as evidenced by Yamazaki.

Yamazaki teaches that when weakly alkaline or non-alkaline glass is used for the substrate (41, column 8, lines 47-57), a foundation film with a thickness at a lower limit of 5 nm (42, column 8, lines 55-57) is directly formed on the glass substrate, for the purpose of preventing ion impurities from diffusing from the glass substrate (moving ions arising from the substrate from entering the semiconductor films, column 8, lines 50-60).

Regarding claim 5, Matsuzaki teaches a liquid crystal display apparatus comprising the substrate assembly (liquid crystal display device, column 9, lines 65-66), but fails to teach that it is a semi-transmitting type.

However, Tanaka teaches that the liquid crystal display apparatus (column 7, lines 35-45) is a semi-transmitting type when the pixel electrode is transflective (semi-

transparent, column 7, lines 5-20), for the purpose of providing the desired semi-transmitting optical properties.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have formed the liquid crystal display apparatus of Matsuzaki into a semi-transmitting type, in order to provide the desired semi-transmitting optical properties, as taught by Tanaka.

4. Claims 2-3 are rejected as being unpatentable over Matsuzaki in view of Tanaka, as evidenced by Yamazaki, regarding claims 1, 5, and further in view of Anzaki (US 6,277,507).

Matsuzaki in view of Tanaka, as evidenced by Yamazaki, teaches a semi-transmitting mirror-possessing substrate assembly comprising: a glass substrate; a foundation film directly formed on said glass substrate; a semi-transmitting reflective film directly formed on said foundation film; and a liquid crystal layer formed on said semi-transmitting reflective film, wherein said foundation film has a thickness in a range of greater than 0 to 8 nm, and wherein said semi-transmitting reflective film is made of at least one selected from the group consisting of Al. In addition, Matsuzaki teaches that the foundation film is made of silicon nitride (SiNx). Matsuzaki in view of Tanaka, as evidenced by Yamazaki, fails to teach that the foundation film is made of silicon oxide (SiOx) wherein a chemical composition ratio x of oxygen (O) to silicon (S) in the silicon oxide (SiOx) is in a range of 1.5 to 2.0.

However, Anzaki teaches that silicon oxide (SiO_x), wherein a chemical composition ratio x of oxygen (O) to silicon (S) in the silicon oxide (SiO_x) is 2. 0, which is

within the claimed range of 1.5 to 2.0, can be used in lieu of silicon nitride (SiO_2, abstract) to make the foundation film formed directly on a glass substrate (insulating film coated on a surface of a glass plate, abstract), for the purpose of utilizing the physical properties of the silicon oxide.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used a silicon oxide (SiO_x) with a chemical composition ratio x of oxygen (O) to silicon (S) which is within the range of 1.5 to 2.0, in lieu of the silicon nitride in the foundation film of Matsuzaki in view of Tanaka, as evidenced by Yamazaki, in order to utilize the physical properties of the silicon oxide, as taught by Anzaki.

5. Claims 6-7 are rejected as being unpatentable over Matsuzaki (US 5,157,470) in view of Tanaka (US 6,686,985) and Anzaki (US 6,277,507), as evidenced by Yamazaki (US 6,326,642).

Regarding claim 6, Matsuzaki teaches a substrate assembly in Fig. 8B, shown on a prior page, comprising: a glass substrate (1, column 3, lines 5-6, Fig. 8B); a foundation film (insulating film 3, Fig. 8B), directly formed on said glass substrate; a pixel electrode film (7, column 3, lines 10-13, Fig. 8B), directly formed on said foundation film; and a liquid crystal layer (25, column 10, lines 19-20, Fig. 8B) formed on said film. Matsuzaki teaches that the pixel electrode film is transmitting (transparent, column 10, lines 15-16), but fails to teach that it is semi-transmitting and reflective, let alone that it is made of aluminum (Al).

However, Tanaka teaches that the pixel electrode film can be semi-transmitting and reflective (transflective type, reflection layer is thinly formed to be semi-transparent, column 7, lines 17-19), made of aluminum (column 7, lines 8-11) instead of transmitting (transmissive, column 7, lines 5-10), for the purpose of providing the desired transflective optical properties (column 7, lines 17-19), and hence a semi-transmitting mirror-possessing substrate assembly.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used a semi-transmitting and reflective film made of aluminum, in place of the transmitting film in the substrate assembly of Matsuzaki, in order to provide the desired transflective optical properties, and hence a semi-transmitting mirror-possessing substrate assembly, as taught by Tanaka.

Matsuzaki in view of Tanaka fails to disclose the thickness of the foundation film.

However, Tanaka teaches that the foundation film (insulator film 201, column 7, lines 20-30), formed directly on the glass substrate (column 7, lines 20-30), is present to prevent impurities from diffusing into the metal films; and that if no diffusion of impurities occur, then the foundation film can be omitted (insulator film 201, column 7, lines 25-30). Thus the claimed thickness range of greater than 0 to 8 nm for the foundation film is the result of the optimization of the process of forming the substrate assembly, as evidenced by Yamazaki.

Yamazaki teaches that when weakly alkaline or non-alkaline glass is used for the substrate (41, column 8, lines 47-57), a foundation film with a thickness at a lower limit of 5 nm (42, column 8, lines 55-57) is directly formed on the glass substrate, for the

purpose of preventing ion impurities from diffusing from the glass substrate (moving ions arising from the substrate from entering the semiconductor films, column 8, lines 50-60).

Matsuzaki in view of Tanaka, as evidenced by Yamazaki, fails to teach that the foundation film is made of silicon oxide (SiOx) wherein a chemical composition ratio x of oxygen (O) to silicon (S) in the silicon oxide (SiOx) is in a range of 1.5 to 2.0.

However, Anzaki teaches that silicon oxide (SiO_x), wherein a chemical composition ratio x of oxygen (O) to silicon (S) in the silicon oxide (SiO_x) is 2. 0, which is within the claimed range of 1.5 to 2.0, can be used in lieu of silicon nitride (SiO_2, abstract), to make the foundation film formed directly on a glass substrate (insulating film coated on a surface of a glass plate, abstract), for the purpose of utilizing the physical properties of the silicon oxide.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used a silicon oxide (SiO_x) with a chemical composition ratio x of oxygen (O) to silicon (S) which is within the range of 1.5 to 2.0, in lieu of the silicon nitride in the foundation film of Matsuzaki in view of Tanaka, as evidenced by Yamazaki, in order to utilize the physical properties of the silicon oxide, as taught by Anzaki.

Regarding claim 7, Matsuzaki teaches a liquid crystal display apparatus comprising the substrate assembly (liquid crystal display device, column 9, lines 65-66), but fails to teach that it is a semi-transmitting type.

However, Tanaka teaches that the liquid crystal display apparatus (column 7, lines 35-45) is a semi-transmitting type when the pixel electrode is transflective (semi-transparent, column 7, lines 5-20), for the purpose of providing the desired semi-transmitting optical properties.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have formed the liquid crystal display apparatus of Matsuzaki in view of Tanaka and Anzaki, as evidenced by Yamazaki, as a semi-transmitting type, in order to provide the desired semi-transmitting optical properties, as taught by Tanaka.

Response to Arguments

6. Applicant's arguments have been considered but are moot in view of the new grounds of rejection.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached on (571)272-1498. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. Hon.

Sow-Fun Hon

08/21/06